Epidemiological Study of Bovine Trypanosomiasis in Woliso Woreda, Ethiopia

Gebreyohannes M. and Legesse F.

Epidemiological Study of Bovine Trypanosomiasis in Woliso Woreda, Ethiopia

Gebreyohannes M. and Legesse F.

Department of Veterinary Pharmacy and Biomedical Science, Faculty of Veterinary Medicine, University of Gondar.

Abstract

A cross sectional study was conducted from September, 2011 up to December, 2011 in South West Showa zone, in Woliso Woreda, Oromia state with the objective of determining the prevalence of bovine Trypanosomiasis. 384 animals were included in the study and hematological examination was conducted to detect the presence of Trypanosome parasites. During the study, from a total of 196 male animals examined, 17 animals (8.67%) were positive to Trypanosomiasis whereas from a total of 188 female animals examined 13 animals (6.91%) were positive to Trypanosome. Even though the prevalence of Trypanosomiasis was relatively higher in male individuals than female individuals there was no significant difference between sexes groups (p>0.05). The overall prevalence of Trypanosomiasis was 7.81%. From a total of Trypanasoma positive animals 28(7.29%) was positive to T.vivax, and 2(0.005%) of them was positive to T. conglense. The prevalence of Trypanosome based on body conditions score were 28 (36%) in poor body condition, 2 (0.92%) in medium body condition and 0 (0%) in good body conditions. statistically significant difference among body condition scoring (p<0.05) was observed. The highest to lowest prevalence rate was recorded in animal age groups of >6 years (11.6%), <2 years (7.4%), 4-6 years (3.86%) and 2-4 years (3.7%). Statistically there was no significant difference among age group (p>0.05). prevalence of Trypanosome in each peasant association revealed that, abado-lamen 11.39%, gurura- baka 10%, chirecha- wanber 8.42% , chafe -mekana 7.24%, and dire-duleti 2.46% .Although there was a slight difference in the prevalence of Trypanosomiasis among the peasant associations there was no significant difference (p>0.05) among them. Packed cell volume was determined by using haematocrit centrifuge and a mean PCV value of 27.1% was recorded.

Keywords: Bovine, trypanosomiasis, woliso, prevalence, haematological examination.
EPIDEMIOLOGICAL STUDY OF BOVINE TRYPANOSOMIASIS IN …

Introduction

Trypanosomosis is one of the major impediments to livestock development and agricultural production in Ethiopia contributory negatively to the all development in general and to food self-reliance efforts so the nation particular. While the tsetse born Trypanosomiasis excluding some 180,000-200,000 km² of agriculturally suitable land in west and south west of the country. 14 million of head of cattle, 7 million of equines 1.8 million of camels are at risk of contracting trypanosomiasis any one time (Langridge, 1976; MOARD, 2004).

Tsetse transmitted trypanosomiasis the main constraints to the livestock production in the continents of Africa, preventing full use of to feed rapidly growing or increasing human population, it affects 37 Sub Saharan African countries extending 10 million km² of land (Erkelens et al., 2000).

The Epizootology of trypanosomiasis in Africa is based on analysis of different factors that condition relationship between three key elements that determine the presence of a given region. The three elements are definitive host (man, domestic or wild animals), parasite living in the host (trypanosoms) and vectors (tsetse flies and other biting flies) (Mirashah and Ralph, 1998).

Animal that infected by Trypanosomiasis showing intermittent fever, anemia, anorexia or pica, progressive loss of condition and increasing weakness hard swelling which is often the first pointers to trypanosomisis, lymph nodes are enlarged in many cause the coat is harsh and abortion may occur. Some cattle recover but other in apparent recovery followed by relapse and death, in acute case death may occur within for tonight (Edward Boden, 2005).

Chemotherapy and chemoprophylaxis are the only practical method available for control of animal trypanosomiasis. But their effectiveness being eroded by emergency of resistance trypanosomes unfortunately farmer can purchase variety of trypanocidal drug in most markets, although all trypanocidal drug are supposed to be imported and supplied though Ministry of Agriculture. The wide spread use of and misuse of drug has contributed to the development of drug resistance in the population T. congense parasites (Codjia et al., 1993; Afework et al., 2000).

Therefore; the main objective of this study was:
To assess the prevalence of bovine trypanosomiasis in Wolisoo woreda.
To identify the associated risk factors of Trypanosomiasis in the district.

Materials and Methods

Study Area

The study was conducted in Woliso woreda, which is one of the woredas in South West Showa zone of Oromia regional state and it is found 114 km far from Addis Ababa.

Study Design

A cross sectional type of study design was employed in order to assess the prevalence of Bovine Trypanosomiasis in the study area.

Sampling Method and Sample Size Determination

Simple random sampling techniques was used to select the study subjects from the population in the study area. The sample size was calculated according to Thrusfield (2005). The expected prevalence was 50% with 95% confidence interval and 5% desired absolute precision (d=0.05);

\[ n = \frac{1.96^2(p)(1-p)}{d^2} \]

Where:
\( n \) = sample size
\( p \) = expected prevalence
\( d \) = desired level precision
\( P_{exp} = 50\% \)
\( d = 5\% \)

\[ n = \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{0.05^2} \]
\[ n = \frac{3.816 \times 0.5 \times (0.5)}{0.0025} \]

\[ n = \frac{3.8416 \times 0.25}{0.0025} \]
\[ n = \frac{0.9604}{0.0025} \]
\[ n = 384 \]

**Investigation Procedure**

Blood sample were collected directly from the marginal ear vein of cattle with sterile lancet and blood fill 2/3 of by Heparinzed capillary tube and seal one end with sealer. After the samples were taken the capillary tube was placed in a centrifuge at 12,000 rpm for 5 minute. After the centrifugation process packed cell volume (PCV) was measured and crush the hematocrite tube at Buffy coat area examined under 40x magnification power of Light microscope. The presence of the parasite was detected by taking blood from ear vein and making thin and thick blood smears on the slide fixed with methanol for 5 minute and drying of and stains with giemsa stain then washed by tape water and finally examined for the morphology of the parasite using oil immersion under microscope 100x.

**Data Collection**

Age, sex and body conditions of the animal were collected. The age of animal grouped in to four age categories <2 year, 2-4 year, 4-6 year and> 6 year. Body condition was collected simply by the visual and palpation of the body as good, medium, and poor. The collected blood sample was labeled by the name of owners, specific village, sex, age and body condition scoring.

**Statistical Analysis**

Data obtained from different variables was coded and uploaded in to Microsoft excel 2007 spread sheet computer program and analyzed using SPSS version 17. Prevalence was calculated by dividing the number of positive animals to the total number of animals examined. Statistical significance was set at \( P < 0.05 \) to determine whether there are significant differences between the parameters measured between the groups.

**Results**

384 animals were exposed for haematological examination and from this the overall prevalence was 7.81%. The mean PCV value and the prevalence rates in each peasant association is shown below in the table. The prevalence recorded from five peasant associations i.e., from Dire Dulai, Chefemekana, Chiracha Wenberi, Gurara Baka And Abade Lemen was 2.46%, 7.24%, 8.42%, 10% and 11.39% respectively. The highest prevalence was in Abado lemen (11.39%) and lowest prevalence in Dire Dulati (2.46%).

<table>
<thead>
<tr>
<th>PA</th>
<th>No of animal examined</th>
<th>No positive</th>
<th>PCV value</th>
<th>Prevalence</th>
<th>P-value</th>
<th>( X^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dire dulati</td>
<td>81</td>
<td>2</td>
<td>26.48</td>
<td>2.46%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abbado Leman</td>
<td>79</td>
<td>9</td>
<td>27.32</td>
<td>11.39%</td>
<td>0.79</td>
<td>1.27</td>
</tr>
<tr>
<td>Chafe mekana</td>
<td>69</td>
<td>5</td>
<td>26.32</td>
<td>7.24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiracha wanbari</td>
<td>95</td>
<td>8</td>
<td>27.68</td>
<td>8.42%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gurura Baka</td>
<td>60</td>
<td>6</td>
<td>27.2</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From a total of 196 male animals examined, 17 animals (8.67%) were positive to Trypanosomasis whereas from a total of 188 female animals examined 13 animals (6.91%) were positive to Trypanosome. Even though the prevalence of Trypanosomiasis was relatively higher in male individuals than female individuals there was no significant difference between sexes groups (\( p > 0.05 \)).
From a total of 384 animals examined for trypanosomiasis 28(97.29%) was positive for T.vivax and 2(0.005%) of the total animals examined was positive for T.conglense. A statistically significant difference was observed (P<0.05) in prevalence between these two species.

Age of animal that showed highest prevalence was recorded in age > 6 and <2 year i.e., 11.6% and 7.4% respectively and lower prevalence was recorded in 2-4 and 4-6 age groups. There was no statistical significant difference between age groups (p>0.05).

From a total of 76, 218, 90 poor, medium and good body condition animals examined, the prevalence was 28 (36.8%), 2(0.92%), 0(0%) respectively. There was a significant difference in prevalence among different body condition scores (P<0.05).

### Discussion

The overall prevalence of disease recorded in the present study was 7.81%. From a total of 384 animals examined for trypanosomiasis 28(97.29%) was positive for T.vivax and 2(0.005%) of the total animals examined was positive for T.conglense. A statistically significant difference was observed (P<0.05) in prevalence between these two species. During the study, from a total of 196 male animals examined, 17 animals (8.67%) were positive to Trypanosomiasis whereas from a total of 188 female animals examined 13 animals (6.91%) were positive to Trypanosome. Even though the prevalence of Trypanosomiasis was relatively higher in male individuals than female individuals there was no significant difference between sexes groups (p>0.05). Age of animal that show highest prevalence was recorded in age > 6 and <2 year i.e., 11.6% and 7.4% respectively and lowest prevalence recorded in 2-4 ages with 3.7% and 4-6 age groups 3.86%. There was no statistical significant difference between age groups (p>0.05).
difference between age groups (p>0.05). From a total of 76, 218, 90 poor, medium and good body condition animals examined, the prevalence was 28(36.8%), 2(0.92%), 0(0%) respectively. There was a significant difference in prevalence among different body condition scores (P<0.05). The current finding was in an agreement with the finding of 8.7% (MOA, 1995), tselemt woreda western Tigay 2.66% (Abebayehu et al., 2011) 6.1% (Sinishaw et al., 2006) bordering lake tana. The result of the present study is lowered compared to the studes among which 43% in Sudan (Salim et al., 2011), 20% and 25% (Chernet et al., 2006) in Amhara region North West, Ethiopia. For low prevalence of trypanosome in my study area is due to tsetse transmitted disease is not dominant, the presence of low prevalence of T. congense is associated with low tsetse infested area. T. congense may enter from endemic area due to animal movement.

The other factor is mechanical transmitted disease when the environment is hostile for mechanical transmitter flies increase also increase disease incidence, generally mechanical transmitted lower than tsetse transmitted area. Regarding the disease more pronounced in the adult >6 year and young age <2 year, the reason may in young immunity of the disease to challenge for trypanosome is low, where as the old age >6 year at the current time farmers used for traction power associate with the stress, this decrease immunity level for challenge of Trypanosoma. The other factor some breed most resistance to trypanosoma, the other breed susceptible to the disease the more exposure to biting flies more victim.

**Conclusion and Recommendation**

Trypanosomiasis indicates a high prevalence in the study area and it brings considerable losses to the livestock production, and productivity. The disease is also known to cause morbidity and mortality of cattle and then loss of draft power. Therefore, the following issues are recommended for both stakeholder involved in control of typanosomosis.

Awareness creation toward the farmer negative impact of wrong treatment and expanding veterinary service.

Integrated approach which is a combination of selective chemotherapy and selective vector control should be considered.

Supplementation of important nutrient feed in dry season is important to avoid stress conditions that affect the host resistance and susceptibility to parasitic diseases.

Detailed studies should be conducted on the epidemiology of the disease in order to expand and implement disease investigation and control strategy.

Construction of veterinary clinic at this site.

Additional survey must be done in the future regarding the prevalence of Tsetse fly.

Application of insecticide pour on animals this decrease mechanical Transmission Trypanosomiasis.

**Acknowledgments**

We, the authors would like to thank the University of Gondar for funding this project and Woliso woreda veterinary health center for technical and material support.

**References**


EPIDEMIOLOGICAL STUDY OF BOVINE TRYPANOSOMIASIS IN ...

Burkina faso, by the use of flunethrin pour-on for cattle Trop. Med. parasitol.
HoARe CA (1972). Trypanosomes mammals Azological monograph oxford and Edinburgh Black well sci. publ.